

ENERGY TO CARE *SUCCESS STORY*

Case Study: JLL-Adventist Health: A System-Wide Effort

By Ed Avis

ASHE.ORG • ENERGYTOCARE.COM • SUSTAINABILITYROADMAP.ORG





JLL-Adventist Health

Total Adventist facilities: 19 hospitals, 280 clinics, 13 home care agencies, 7 hospice agencies, 4 retirement centers

Employees: 25,000

Annual utilities expenses: \$40 million annual utilities expenses

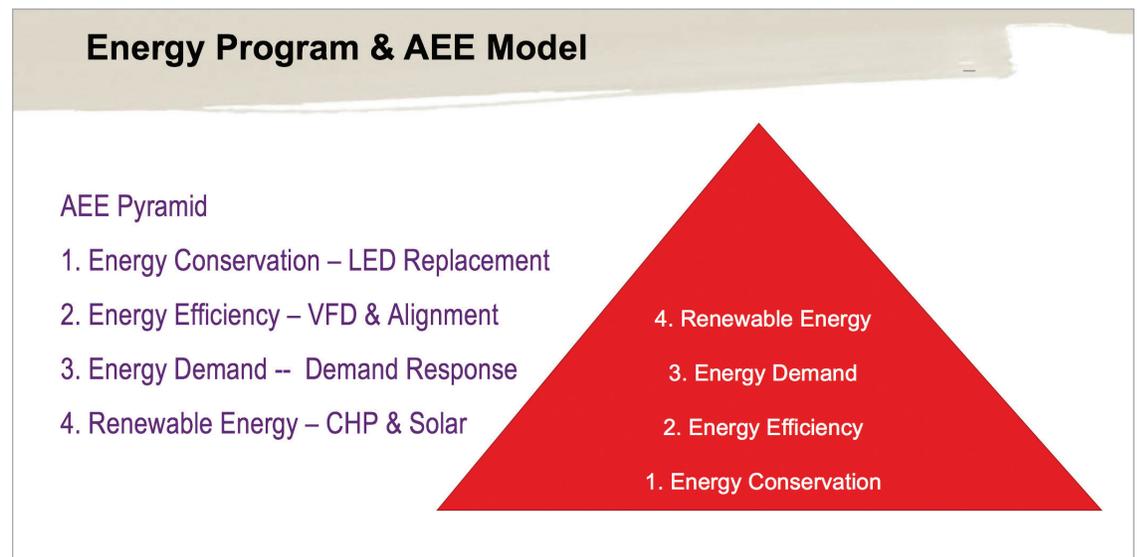
ENERGY STAR rating: (Sonora Regional Medical Center) = 88

Trimming energy costs in a hospital is challenging, but that challenge is multiplied when a large system decides to cut energy costs. That’s what Matthew Atwong faced when he joined Adventist Health, a 19-hospital organization with facilities in California, Oregon, and Hawaii, in 2014.

Atwong is the corporate engineering director for JLL-Adventist Health, the partnership that operates Adventist’s facilities. He remembers that the initial ENERGY STAR® scores for Adventist’s facilities ranged no higher than 50. ENERGY STAR certification requires a score of 75, so the challenge was significant.

“To get to that score, we knew we had to do different energy-saving methods,” Atwong says. “There are a lot of options. Some of them are high cost and some are low cost. Being a non-profit organization, we chose the low-cost ways.”

Adventist started by adopting the Association of Energy Engineers (AEE) Energy Conservation Model and Pyramid. The base of the pyramid is energy conservation.



Step 1: Conservation

“For us, conservation started with culture,” Atwong says. “It started with teaching people to turn off the lights when you don’t need them on. Turn off the heat when you don’t need it. Go back to basics 101 to what our mother and grandmother taught us when we were growing up. At night turn off computer, and when you come in in the morning, turn it on again. This saves an average of \$15 to \$20 per computer per year, so that’s a ton a money right there.”

The next step for Adventist was to change its lighting to LED bulbs wherever possible. They didn’t buy just any LED bulbs; they researched the options and chose a bendable, non-breakable LED tube from a company called Luxul.

“We chose this because it won’t shatter, and in a hospital, that’s a safety feature,” Atwong says.

The cost of the Luxul model, which is made in California, is about 25 percent more than the average LED bulb, Atwong says. Leadership recommended that all of the hospitals in the Adventist system switch to the new bulbs as feasible, although some hospitals opted for less expensive brands.

Eventually Adventist installed 21,000 Luxul bulbs throughout the system, plus a few thousand LEDs from other brands. In some cases, the hospitals switched out the old lights in large groups, while others replaced the bulbs when the existing bulb burned out.

The local utilities facilitated the switch to LED with rebates. To earn the rebates, Adventist had to get the bulbs approved and had to apply for the rebate before the project began. In some communities, the rebates were determined by the energy differential before and after the switch; in others the rebate was a flat payment per bulb changed.

Adventist also addressed that first layer in the pyramid by initiating water use reduction efforts and improved waste management. For example, Adventist Health White Memorial in Los Angeles changed all the toilets to low flow, reduced the amount of irrigation for the landscaping, and added high efficiency Water Savers laminar flow devices on the faucets. White Memorial was awarded the Los Angeles Department of Water and Power 2018 Sustainability Award for reducing water usage by 9.3 percent in drought-stricken California.

Adventist also installed a cogeneration facility at White Memorial that generates electricity using less expensive natural gas.

“This supplements the energy that we take from the grid,” Atwong explains. “And when the natural gas is burned it also generates heat, which we capture with a heat recovery unit. So we generate our own power and heat at a lower fuel rate than we buy from the utility company. In turn we reduce the reliance on utility companies, and free up their capacity to supply the community.”

Step 2: Energy Efficiency

The second layer in the AEE Energy Conservation Model and Pyramid is energy efficiency. Adventist found efficiencies largely by improving the maintenance on its equipment.

“In the hospital industry we have a lot of equipment, so we made a special effort to make sure we followed the maintenance program correctly,” Atwong says. “We estimate that by doing that we saved 2 to 7 percent of the energy the equipment uses.”

Atwong and his colleagues also improved equipment efficiency by upgrading where possible. For example, they found some after-market belts and pulleys for some motors that were more efficient than the originals. They also added variable frequency drives to some motors, and made sure the filters in the HVAC system were the most efficient possible.

Those first two steps in the pyramid — conservation and improving efficiency — resulted in \$5.9 million energy savings in 2017, Atwong reports. That’s on top of the savings of the three previous years in the program; altogether the efforts have saved Adventist \$13 million.

Sonora Regional Medical Center, an Adventist hospital in Sonora, California, was the first Adventist facility to achieve ENERGY STAR designation in 2016. In addition to the conservation and efficiency efforts mentioned above, Sonora installed a digital energy management system to control its HVAC and plumbing systems and advanced modulating fuel oil burners that save up to 200 gallons of fuel oil each day. Those efforts helped Sonora achieve an ENERGY STAR rating of 88.

Adventist’s efforts to date have earned the system a raft of awards, including the 2018 California State Energy Championship and four other local energy championships from the California Society for Healthcare Engineering. Seven Adventist buildings received the 2018 ASHE Energy to Care Award for reducing energy use by 10 percent or more.

The Future

Adventist’s journey to sustainability has many miles ahead of it, as the system has not yet fully addressed the next two levels in the AEE pyramid: demand and renewables.

Atwong says the system is considering the demand issue in terms of the lower rates utility companies offer for energy usage in off-peak times.

“We looked at our energy usage profile, and saw that our consumption starts to creep up between 8 and 9 a.m. when staff and patients come in and staff start to turn on the equipment such as x-rays and CT-scans,” Atwong says. “It starts to go down around 2 or 3 p.m., because the lab work is done and doctors go back to routines and patients go back into their rooms. So we studied that, and said if we can minimize the energy usage during the day, between 10 and 6 when the rates are higher, and shift it to the lower rate period, we could save money.”

As far as renewables, Atwong reports that a program to install 18 solar power panel systems throughout Adventist has been approved and will begin in 2019. Even further down the road, Atwong envisions Adventist moving to a micro grid in which the facilities generate their own energy and have it redirected as needed by an advanced control system.

“When you have a micro grid you are essentially energy independent,” he says. “You use solar to generate energy and store it in a battery, or you use cogen facilities if you have natural gas. But then you have to develop the micro grid controller to store and redirect the power as needed. We have submitted four hospitals for a microgrid hospital project for DOE (Department of Energy) grants, so we’re close to having those dreams come true.”

The Energy to Care program, sponsored by Johnson Controls, encourages hospitals across the country to reduce their energy consumption by 10 percent or more over their baseline energy consumption. Since 2009, hospitals participating in the Energy to Care program have tracked more than \$67 million in energy savings. This free program includes a robust energy-benchmarking tool in addition to the awards. ASHE congratulates these hospitals for their leadership in reducing energy consumption.



**The American Society for Healthcare Engineering (ASHE)
of the American Hospital Association**

155 North Wacker Drive, Suite 400, Chicago, IL 60606
312-422-3800 | ashe@aha.org | www.ashe.org

 energy to care
*Greater efficiency
supports patient care.*

Start benchmarking your energy data
today at energytocare.com



Find sustainability project ideas for your
facility at sustainabilityroadmap.org